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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,940	09/29/2006	Ya Xu	2006-1228A	6659
513 7590 09/02/2008 WENDEROTH, LIND & PONACK, L.L.P. 2033 K STREET N. W. SUITE 800 WASHINGTON, DC 20006-1021			EXAMINER VAN OUDENAREN, SARAH A	
			ART UNIT 4162	PAPER NUMBER
			MAIL DATE 09/02/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/587,940

**Applicant(s)**

XU ET AL.

**Examiner**

SARAH VAN OUDENAREN

**Art Unit**

4162

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-85/86)
- Paper No(s)/Mail Date 11/8/2006 and 8/2/2006
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

Claim 2 is objected to because of the following informalities: Line 4 recites "(wt%)".

Parentheses should be removed. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2 and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "coexistent components" in line 2. It is unclear as to what applicant means by this limitation. Examiner takes the position that "coexistent components" is intended to mean other components in the catalyst in addition to  $\text{Ni}_3\text{Al}$ .

Claim 5 recites the limitation "the surface thereof" in line 3. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirano et al (US 6,444,061). Hirano teaches a Ni<sub>3</sub>Al intermetallic compound (col 1, line 11).

Regarding claim 2, Hirano teaches the intermetallic compound of Ni<sub>3</sub>Al containing Al in the amount of 12.8-13.6 wt% and Ni being the main component (col 2, lines 40-45). Hirano also teaches possible additives such as manganese, iron, and boron being added (col 3, lines 53-54).

Regarding claims 4 and 11, Hirano teaches the Ni<sub>3</sub>Al alloy being prepared by unidirectional solidification and then cold-rolling the formed compound to form a foil (col 2, lines 5-10). It is noted however, "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.", (In re Thorpe, 227 USPQ 964,966). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product (*In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-3, 7-10, 15, 16, 20, 21, 25 are rejected under 35 U.S.C. 102(a) as being anticipated by Xu et al (*Catalytic Properties of Alkali-leached Ni<sub>3</sub>Al for Hydrogen Production from Methanol*). Xu teaches a Ni<sub>3</sub>Al intermetallic compound for methanol decomposition (page 151, paragraph 3).

Regarding claim 2, Xu teaches that the alloy which may have a surface mixture of Ni<sub>3</sub>Al and Ni (page 155, paragraph 1) contains 12.7 wt% Al.

Regarding claims 3 and 10, Xu teaches the Ni<sub>3</sub>Al alloy ingot was prepared by conventional melting, then was machined and crushed to powders by milling, and polished (page 152, paragraph 1, lines 1-15). It is noted however, "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.", (In re Thorpe, 227 USPQ 964,966). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence

establishing an unobvious different between the claimed product and the prior art product (*In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113).

Regarding claims 7, 15, and 16, Xu teaches the  $\text{Ni}_3\text{Al}$  intermetallic compound undergoing alkali leaching in order to increase the catalytic activity (page 154, paragraph 4, lines 1-3).

Regarding claims 8, 9, 20, 21, and 25, Xu teaches that the  $\text{Ni}_3\text{Al}$  powder is reduced in a hydrogen atmosphere and then a mixture of methanol and water is brought into contact with the catalyst in order to produce hydrogen (page 152, paragraph 2, lines 1-15).

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirano et al (US 6,444,061) as applied to claims 1 and 4 above, and further in view of

Xu et al (*Catalytic Properties of Alkali-leached Ni<sub>3</sub>Al for Hydrogen Production from Methanol*). Hirano teaches a Ni<sub>3</sub>Al intermetallic compound (col 1, line 11) as discussed above, but does not teach an alkali treatment. Xu teaches a Ni<sub>3</sub>Al intermetallic compound for methanol decomposition (page 151, paragraph 3) also, as discussed above and also teaches the Ni<sub>3</sub>Al intermetallic compound undergoing alkali leaching in order to increase the catalytic activity (page 154, paragraph 4, lines 1-3). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the Ni<sub>3</sub>Al intermetallic compound of Hirano with the alkali leaching of Xu in order to increase the catalytic activity.

Regarding claim 22, Xu teaches that the Ni<sub>3</sub>Al powder is reduced in a hydrogen atmosphere and then a mixture of methanol and water is brought into contact with the catalyst in order to produce hydrogen (page 152, paragraph 2, lines 1-15). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the Ni<sub>3</sub>Al intermetallic compound of Hirano with the hydrogen production process of Xu in order to effectively produce hydrogen using the compound.

Claims 5, 6, 12, 13, 18, 19, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al (*Catalytic Properties of Alkali-leached Ni<sub>3</sub>Al for Hydrogen Production from Methanol*) as applied to claims 1, 2, and 3 above, and further in view of Lashmore et al (US PG Pub 2008/0014431). Xu teaches a Ni<sub>3</sub>Al intermetallic compound for methanol decomposition (page 151, paragraph 3) as discussed above. However, Xu does not teach carbon nanofibers containing metal fine particles being deposited on the

surface. Lashmore discusses a catalyst particle may be embedded in a nanotube fiber (page 1, paragraph 4, lines 8-13). Lashmore also teaches a substrate having catalyst particles deposited on the substrate (page 1, paragraph 8, lines 4-8) and that these catalyst particles can be nickel and its alloys. It would have been obvious to one of ordinary skill in the art at the time of the invention to include the  $\text{Ni}_3\text{Al}$  intermetallic compound of Xu with the carbon nanofibers of Lashmore because the carbon nanofibers of Lashmore are synthesized on the surface of the catalytic particles which are taught as Ni or alloys of Ni and that the nanofibers may also contain catalytic particles.

Regarding claim 6, Lashmore teaches that the carbon nanotube fibers may contain catalyst particles (page 1, paragraph 4, lines 8-13) and that the catalyst particles are Ni or its alloys. It would have been obvious to one of ordinary skill in the art at the time of the invention to include the particles of Lashmore with the  $\text{Ni}_3\text{Al}$  intermetallic compound of Xu in order to aid in increased catalytic performance.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirano et al (US 6,444,061) as applied to claim 1 and 4 above, and further in view of Lashmore et al (US PG Pub 2008/0014431). Hirano teaches a  $\text{Ni}_3\text{Al}$  intermetallic compound (col 1, line 11) as discussed above, but does not teach carbon nanofibers containing metal fine particles being deposited on the surface. Lashmore discusses a catalyst particle may be embedded in a nanotube fiber (page 1, paragraph 4, lines 8-13). Lashmore also teaches a substrate having catalyst particles deposited on the substrate (page 1,

paragraph 8, lines 4-8) and that these catalyst particles can be nickel and its alloys. It would have been obvious to one of ordinary skill in the art at the time of the invention to include the  $\text{Ni}_3\text{Al}$  intermetallic compound of Hirano with the carbon nanofibers of Lashmore because the carbon nanofibers of Lashmore are synthesized on the surface of the catalytic particles which are taught as Ni or alloys of Ni and that the nanofibers may also contain catalytic particles.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARAH VAN OUDENAREN whose telephone number is (571)270-5838. The examiner can normally be reached on Monday-Thursday, 9:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SVO

/Jennifer McNeil/

Supervisory Patent Examiner, Art Unit 4162